

What is claimed is:

1. An exposure device comprising:

a stage for placing a light transmissive substrate over which a photosensitive film is formed;

5 a light source for irradiating said photosensitive film from a back side of said light transmissive substrate; and

a reflecting means being opposite to a front side having said photosensitive film of said light transmissive substrate and apart from said photosensitive film by a predetermined distance.

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2. A device according to claim 1, wherein said reflecting means is a substrate on which a film comprising a reflective material is formed.

15 3. A device according to claim 1, wherein said photosensitive film is a photoresist film.

4. A device according to claim 1, wherein said photosensitive film is formed over a pattern comprising a light-shielding film.

20 5. An exposure method comprising steps of:

forming a pattern comprising a light-shielding film over a front side of a light transmissive substrate;

forming a photosensitive film over said pattern;

preparing a reflecting means located opposite to said

photosensitive film;

prepare a light source for emitting a light; and

exposing said photosensitive film by irradiating it from a  
back side of said substrate with said light emitted from said light  
source while using said pattern as a mask wherein a reflecting means  
reflects a light passing through said photosensitive film, thereby said  
photosensitive film is irradiated from the front side of said substrate  
with the light and is exposed.

10 6. An exposure method comprising steps of:

forming a pattern comprising a light-shielding film over a  
front side of a light transmissive substrate;

forming a photosensitive film over said pattern; and

15 exposing said photosensitive film by irradiating it from a  
back side of said substrate with light emitted from a light source  
while using said pattern as a mask, and reflecting or scattering by a  
reflecting means, which is opposite to said front side of said substrate,  
the light from the light source which has penetrated through said  
photosensitive film, so that said photosensitive film is irradiated from  
20 the front side of said substrate with the light and is exposed.

7. A method as claimed in claim 6, wherein a shape of the  
photosensitive film formed over said pattern corresponds to a  
reduced shape of said pattern comprising the light-shielding film.

8. A method for manufacturing a semiconductor device comprising steps of:

forming a gate electrode over a front side of a substrate;

5 forming a semiconductor film over said gate electrode with a gate insulating film interposed therebetween;

forming a photosensitive film over said semiconductor film;

preparing a reflecting plate apart from a surface of said photosensitive film by a predetermined distance;

10 preparing a light source for emitting a light; and

exposing said photosensitive film by irradiating it from a back side of said substrate with said light emitted from said light source using said gate electrode as a mask and said reflecting plate for reflecting light having penetrated through said photosensitive film thereby said photosensitive film is irradiated from front side of said 15 substrate with the light.

9. A method according to claim 8, wherein said semiconductor device is selected from the group consisting of a video camera, a 20 digital camera, a head mount display, goggle type display, an wearable display, a navigation system for vehicles, a personal computer, a portable information terminal a mobile computer, a cellular phone, and an electronic book and comprises an EL display device.

10. A method of manufacturing a semiconductor device, comprising steps of:

5 forming a pattern comprising a light-shielding film over a front side of a light transmissive substrate;

forming a photosensitive film over said pattern;

reflecting or scattering by a reflecting means, which is opposite to said front side of said substrate, light from a light source which has penetrated through said photosensitive film, and 10 irradiating said photosensitive film with the light from the front side of said substrate to expose the film; and

developing the exposed photosensitive film.

11. A method according to claim 10, wherein said semiconductor 15 device is selected from the group consisting of a video camera, a digital camera, a head mount display, goggle type display, an wearable display, a navigation system for vehicles, a personal computer, a portable information terminal a mobile computer, a cellular phone, and an electronic book and comprises an EL display 20 device.

12. A method of manufacturing a semiconductor device, comprising steps of:

forming a pattern comprising a light-shielding film over a

front side of a light transmissive substrate;

forming a photosensitive film over said pattern;

exposing said photosensitive film by irradiating it from a  
5 back side of said substrate with light emitted from a light source  
while using said pattern as a mask, and reflecting or scattering by a  
reflecting means, which is opposite to said front side of said substrate,  
the light from the light source which has penetrated through said  
photosensitive film, so that said photosensitive film is irradiated from  
the front side of said substrate with the light and is exposed; and

10 developing the exposed photosensitive film.

13. A method according to claim 12, wherein said semiconductor  
device is selected from the group consisting of a video camera, a  
digital camera, a head mount display, goggle type display, an  
15 wearable display, a navigation system for vehicles, a personal  
computer, a portable information terminal a mobile computer, a  
cellular phone, and an electronic book and comprises an EL display  
device.

20 14. A method of manufacturing a semiconductor device,  
comprising steps of:

forming a gate wiring over a front side of a light  
transmissive substrate;

forming a gate insulating film on said gate wiring;

forming a semiconductor film on said gate insulating film;  
forming a photosensitive film over said semiconductor film;  
exposing said photosensitive film by irradiating it from a  
back side of said substrate with light emitted from a light source  
5 while using said gate wiring as a mask, and reflecting or scattering by  
a reflecting means, which is opposite to said front side of said  
substrate, the light from the light source which has penetrated  
through said photosensitive film, so that said photosensitive film is  
irradiated from the front side of said substrate with the light and is  
10 exposed;

removing an exposed part of the photosensitive film to form  
a pattern comprising the photosensitive film; and  
doping said semiconductor film with a dopant for imparting  
a conductivity using as a mask said pattern comprising the  
15 photosensitive film.

15. A method according to claim 14, wherein said semiconductor  
device is selected from the group consisting of a video camera, a  
digital camera, a head mount display, goggle type display, an  
wearable display, a navigation system for vehicles, a personal  
20 computer, a portable information terminal a mobile computer, a  
cellular phone, and an electronic book and comprises an EL display  
device.

16. A method of manufacturing a semiconductor device, comprising steps of:

forming a gate wiring over a front side of a light transmissive substrate;

5 forming a gate insulating film on said gate wiring;

forming a semiconductor film on said gate insulating film;

forming an insulating film on said semiconductor film;

forming a photosensitive film on said insulating film;

10 exposing said photosensitive film by irradiating it from a back side of said substrate with light emitted from a light source while using said gate wiring as a mask, and reflecting or scattering by a reflecting means, which is opposite to said front side of said substrate, the light from the light source which has penetrated through said photosensitive film, so that said photosensitive film is 15 irradiated from the front side of said substrate with the light and is exposed;

removing an exposed part of the photosensitive film to form a pattern comprising the photosensitive film;

20 selectively removing said insulating film using said pattern as a mask to form a pattern comprising said insulating film;

removing said pattern comprising the photosensitive film;

and

doping said semiconductor film with a dopant for imparting a conductivity using as a mask said pattern comprising the insulating

film.

17. A method according to claim 16, wherein said second pattern is small in size as compared to said gate wiring pattern, and is larger  
5 than said first pattern.

18. A method according to claim 16, wherein the shape of said pattern comprising the photosensitive film corresponds to a reduced shape of said gate wiring pattern.

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19. A method according to claim 16, wherein said reflecting means is a reflecting plate on which a film comprising a reflective material is formed.

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20. A method according to claim 16, wherein said insulating film is a layer selected from a silicon nitride film, a silicon oxide nitride film, a silicon oxide film and an organic resin film, and a laminated film of those.

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21. A method according to claim 16, wherein said semiconductor device is selected from the group consisting of a video camera, a digital camera, a head mount display, goggle type display, an wearable display, a navigation system for vehicles, a personal computer, a portable information terminal a mobile computer, a

cellular phone, and an electronic book and comprises an EL display device.

22. A method of manufacturing a semiconductor device,

5 comprising steps of:

forming a gate wiring over a front side of a light transmissive substrate;

forming a gate insulating film on said gate wiring;

forming a semiconductor film on said gate insulating film;

10 forming an insulating film on said semiconductor film;

forming a photosensitive film on said insulating film;

15 exposing said photosensitive film by irradiating it from a back side of said substrate with light emitted from a light source while using said gate wiring as a mask, and reflecting or scattering by a reflecting means, which is opposite to said front side of said substrate, the light from the light source which has penetrated through said photosensitive film, so that said photosensitive film is irradiated from the front side of said substrate with the light and is exposed;

20 removing an exposed part of the photosensitive film to form a pattern comprising the photosensitive film;

selectively removing said insulating film using said pattern as a mask to form a pattern comprising said insulating film;

removing said pattern comprising the photosensitive film;

and

doping said semiconductor film with a dopant for imparting a conductivity using as a mask said pattern comprising the insulating film.

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23. A method according to claim 22, wherein said second pattern is small in size as compared to said gate wiring pattern, and is larger than said first pattern.

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24. A method according to claim 22, wherein the shape of said pattern comprising the photosensitive film corresponds to a reduced shape of said gate wiring pattern.

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25. A method according to claim 22, wherein said reflecting means is a reflecting plate on which a film comprising a reflective material is formed.

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26. A method according to claim 22, wherein said insulating film is a layer selected from a silicon nitride film, a silicon oxide nitride film, a silicon oxide film and an organic resin film, and a laminated film of those.

27. A method according to claim 22, wherein said semiconductor device is selected from the group consisting of a video camera, a

5 digital camera, a head mount display, goggle type display, an  
wearable display, a navigation system for vehicles, a personal  
computer, a portable information terminal a mobile computer, a  
cellular phone, and an electronic book and comprises an EL display  
device.

28. A method of manufacturing a semiconductor device,  
comprising steps of:

10 forming a gate wiring over a front side of a light  
transmissive substrate;

forming a gate insulating film on said gate wiring;

forming a semiconductor film on said gate insulating film;

forming an insulating film on said semiconductor film;

forming a first photosensitive film on said insulating film;

15 exposing said first photosensitive film by irradiating it from  
a back side of said substrate with light emitted from a light source  
while using said gate wiring as a mask, and reflecting or scattering by  
a reflecting means, which is opposite to said front side of said  
substrate, the light from the light source which has penetrated  
20 through said first photosensitive film, so that said first photosensitive  
film is irradiated with the light from the front side of said substrate  
and is exposed;

removing an exposed part the first photosensitive film to  
form a pattern comprising the first photosensitive film;

selectively removing said insulating film while using said pattern as a mask to form a first pattern comprising the insulating film;

removing said pattern comprising said first photosensitive film;

forming a second photosensitive film;

exposing said second photosensitive film by irradiating it from the back side of said substrate with light emitted from the light source while using said gate wiring as a mask, and reflecting or scattering by a reflecting means, which is opposite to the front side of said substrate, the light from the light source which has penetrated through said second photosensitive film, so that said second photosensitive film is irradiated with the light from the front side of said substrate and is exposed;

removing an exposed part of the second photosensitive film to form a second pattern comprising the second photosensitive film;

doping with a high concentration of dopant for imparting conductivity while using as masks said first pattern and said second pattern;

removing said second pattern; and

doping a low concentration of dopant for imparting conductivity while using as a mask said first pattern.

29. A method according to claim 28, wherein said second pattern

is small in size as compared to said gate wiring pattern, and is larger than said first pattern.

30. A method according to claim 28, wherein the shape of said pattern comprising the photosensitive film corresponds to a reduced shape of said gate wiring pattern.

31. A method according to claim 28, wherein said reflecting means is a reflecting plate on which a film comprising a reflective material is formed.

32. A method according to claim 28, wherein said insulating film is a layer selected from a silicon nitride film, a silicon oxide nitride film, a silicon oxide film and an organic resin film, and a laminated film of those.

33. A method according to claim 28, wherein said semiconductor device is selected from the group consisting of a video camera, a digital camera, a head mount display, goggle type display, an wearable display, a navigation system for vehicles, a personal computer, a portable information terminal a mobile computer, a cellular phone, and an electronic book and comprises an EL display device.

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